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A HANDBOOK

OF

VINE AND FRUIT TREE CULTIVATION,

AS ADAPTED TO

SIR JOSEPH PAXTON'S PATENT HOTHOUSES.

BY

SAMUEL HEREMAN.

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VINE AND FRUIT TREE CULTIVATION.

I.—INTRODUCTORY REMARKS.

Orchard-Houses were first brought into public notice about ten years ago. That the originator of the idea met a great want, is fully proved by their extensive adoption, and the rapid progress which has been made in the cultivation of orchard-house trees. Large houses of this description are now rising everywhere, and they not only form healthy promenades, but produce an abundant supply of fruit, both from trees in pots, and from those planted out in prepared borders.

The objects aimed at in the adoption of these structures, were, to produce in our varying climate, as much fruit as possible within a small space; to afford, by rendering cultivation simple and easy, a large amount of pleasure to the cultivator; and also to make the structure itself, at a small cost, an ornament to the garden in which it was placed. The two first objects were then only partially attained, for the first orchard-houses merely consisted of glass roofs, with boarded ends, the sides being planted with evergreens, which when closely cut formed sheltering hedges. This imperfect system was afterwards superseded by houses with boarded sides, as well as ends, and ventilation was secured by wooden shutters, both at back and front, unless when the houses were placed against garden walls.

At the present day, by the assistance of machinery, far more effective and even ornamental structures are built, with but little additional expense, which not only fulfil all the requirements of horticulture much better than the old rough wooden sheds, but they may be placed either temporarily or permanently in any conspicuous situation in the garden. Amongst these latter improvements, Sir Joseph Paxton's patent hothouses stand most prominent, and being the result of long experience and observation, deserve the full attention of all lovers of gardening; the plan is so simple and yet so efficient, that it is difficult to imagine how any thing more to the purpose, could have been invented.

Orchard-house cultivation may be considered however only yet in its infancy; the wonders which have already been achieved merely suggest how much more may be accomplished, and it is not unlikely that England, with all its disadvantages of climate, will at no distant day, be better supplied with the choicest fruit, and at a more moderate cost, than any other nation in the world: the cheapness of glass, wood, and iron, and the increasing interest at present taken in the cultivation of fruits, naturally lead to the conclusion that improvement will succeed improvement, until every working man will find it easy to obtain a portion of glass, and thus literally sit under his own vine and fig tree.

Sir Joseph Paxton's patent hothouses are made of the best materials, and of sufficient strength to stand as permanent buildings—indeed the sashes are much stronger than those generally used in ordinary and old-fashioned structures—and with proper care and attention in repainting them, there is no doubt they will outlast all ordinary glass houses; and though from the simplicity of the arrangement, the sashes admit of being removed or rendered portable, they are so strong, that as usually erected for permanent houses, they are remarkably secure, cheap, and lasting buildings.

It is an especial peculiarity that they are capable of being made perfectly secure as temporary structures, by slightly varying the method of erection, and yet retain all the appearance of the most permanent buildings: this must be considered a great boon to all annual tenants, and holders of short leases. Dr. Lindley, than whom no better authority can be adduced, after having examined them in action in Sir Joseph's garden at Sydenham, has in the "Gardeners' Chronicle" of July 28, 1860, very kindly expressed himself as follows:—"The merits of these houses consist of good construction, good arrangement, easy portability, and cheapness; without any pretence to high finish or elaborate workmanship, which in such structures represents a mere waste of money, they are perfectly well made, and their arrangement is as simple as ingenuity can render them; no rafters obscure the light and make them cumbrous, no sashes have to be pushed up or let down by ever breaking lines and weights, or by expensive mechanical contrivances, and yet all the ventilation requisite in such buildings is perfectly secured." This is effected by means of narrow glass flaps hinged over spaces between each pair of sashes, and half, or the whole, or only the smallest aperture may be opened, at the option of the cultivator. The sashes being hinged together, the roof can be fixed at any angle, all that is required is to have suitable ends made for the purpose.

These useful structures have received such high patronage, and have become so well known, that already hundreds of gardens exhibit them where fruit houses were formerly considered beyond the reach of their occupiers; this patent has therefore given an immense impetus to a branch of industry and a source of pleasure hitherto unemployed and unknown, and the manufacture of these houses by thousands is not to be despised even in a national point of view.

It must not, however, be disguised, that their portability has been disputed, and the question has been raised in a court of law, whether the patent was not an infringement of the Building Act. The institutor of the indictment assumed that the sashes were bolted to wall plates, or otherwise made fixtures; this, however, could not be established; and it was proved that where the sashes are put up as moveable structures there are no fastenings to the permanent walls of any kind that bring them within the meaning of the Act.

In ordinary cases side-lights are not supplied on this plan; indeed, for fruit growing their adoption only entails unnecessary expense, as they are not generally needed except in particular situations, or where houses are required for plant-culture alone. The water gutter rests in saddles or chairs set on piers, and the vine and fruit borders are raised above the original surface of the garden; this gives the appearance of a sunken walk inside the house, but without excavation. This plan possesses several advantages,—the vine borders are kept well drained, and become warmed by the action of the sun; they in consequence afford a greater resistance to the effects of frost, and the heating apparatus is so elevated as to prevent the possibility of its becoming waterlogged.

In the manufacture of these houses the best red deal is used, the frames are well fitted together, glazed with 16 ounce glass and covered with three coats of good paint. When heavier glass is used, the woodwork is made proportionately stronger. In span-roofed houses the sashes are simply hinged together at the top, and when erected support each other without rafters, and as each pair is hooked to the other by irons, no part is capable of giving way. In lean-to houses back platings are not ordinarily required, the sashes simply leaning against the wall, the closely fitting cap effectually preventing the entrance of wet; in flat angles, however, and where the roof is more than 12 feet in length, a back plate greatly relieves the thrust; but there is no necessity to fasten the sashes to it unless the structure is intended to be a fixture. Air is admitted by glass flaps, which are opened at pleasure with an iron stay and pin; but in large ranges the whole may be opened or shut by means of a rod and lever. At the foot of each sash the side styles are left 4 inches long in the manner of horns; these rest in the angled gutter, so as not to come in contact with the water-course. The gutter is supported by saddles, which are built either on brick or concrete piers, and effectually meet the thrust and keep the house steady and firm. When the sashes are intended as permanent structures they are screwed to the back plating, and the bottom of the sashes are fastened to the gutters and saddles so as to connect the whole with the brick-work.

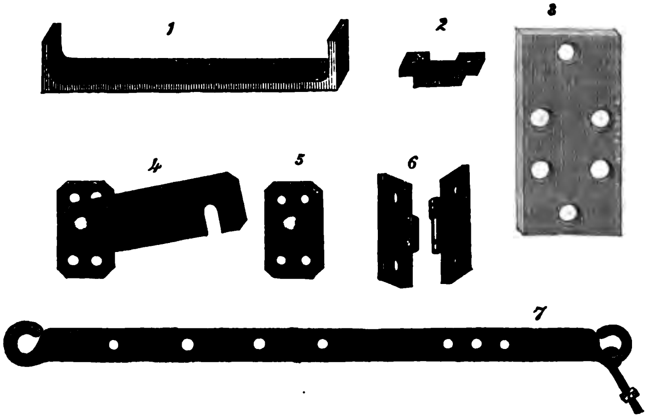
II.—HINTS FOR THE ERECTION AND ARRANGEMENT OF SIR JOSEPH PAXTON'S PATENT HOTHOUSES,

AND ALSO FOR VARIOUS ORNAMENTAL CONSERVATORIES.

THE APPROVED METHOD OF ERECTION.

First, make a setting-out rod by fastening long strips of laths together with screws to the full length of the house intended to be erected; upon this rod, laid on the ground, mark off the width of each sash in its proper position, measuring the width of the first from one end of the rod (the sashes will either be 4 feet 7 inches, or 4 feet 8 inches wide, according to their strength); then allow a space the length of the gauge-bar (Fig. 1), which connects the first sash with the second; the space between the sashes governed by this bar is 9 inches. Afterwards mark off the width of the second sash, and the second space for the gauge-bar, and so proceed to the end of the range.

Figs. 1 to 7.



Having thus marked on the setting-out rod the precise position of each sash, and each space for ventilation, to the whole length of the house, proceed to mark on the ground the places for each of the piers, taking the ends of the rod and the middles of the spaces as centres. Each pier, if built of bricks, should be 14 inches square, and at such a distance from the back wall as the arranged span of the house determines; the piers so placed will always come under the side styles of the sashes. When piers are required higher than 2 feet, and when the sashes are 14, or 16 feet long, it is better to build them 14 inches by 18 inches, the latter measure from the inside of the house outwards. When piers are built of stone or concrete, this size need not be increased more than the nature of the materials demands, to afford sufficient strength. Fig. 8 represents the section of a pier of rough stone or concrete, the inside being kept perpendicular, and the outside sloping so as to form an abutment to meet the thrust of the sashes.

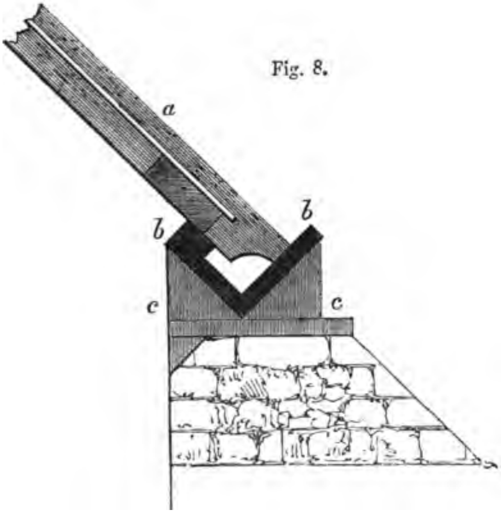


Fig. 8.

When the piers are built and sufficiently set, fix on the saddles (*c c*); cement will be required if the piers are of brick or stone, but if the piers are of concrete, lime mortar; the saddle-board (*c c*) being always placed quite level. A fall, just sufficient to allow the water from the roof to run to one end of the gutter, and be there discharged, must be allowed in the length of the house.

In the absence of a plan, the distance of the piers from the back wall of a lean-to house may be found by measuring across the door and the base of the end sashes, from the back to the front, terminating under the roof sash above the point (*b*); and if a span-roof, a similar measurement will give the span of the house. The piers on both sides of a span are similar, and must be precisely opposite to each other, at right angles to the path line of the house. And when a plan of the end is sent, it is advisable to verify it by measuring the actual sashes as above.

The saddles being properly fixed, place in the water-gutter (Fig. 8, *b b*); this runs continuously the whole length of the structure, each length of gutter meeting and joining in one or other of the saddles. In this gutter the lower ends, or horns, of the sashes are placed (Fig. 8, *a*).

In a lean-to house the top of the sash is simply leaned against the wall, and except in large sizes, does not require any plate for support, as Fig. 20; but in a span-roof the sashes support each other. To effect this, each pair is connected by two hinges, let into the styles at the top, as Fig. 9, *a*, and by erecting two sashes thus hinged, and fitting them over the end sashes, the position of the gutter, saddles, and piers on the other side of the span is accurately determined.

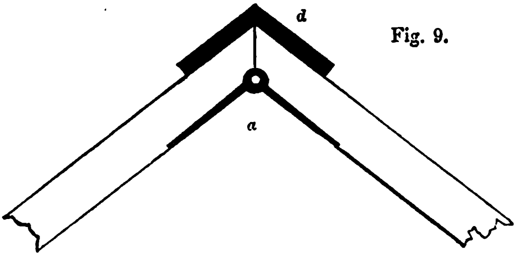


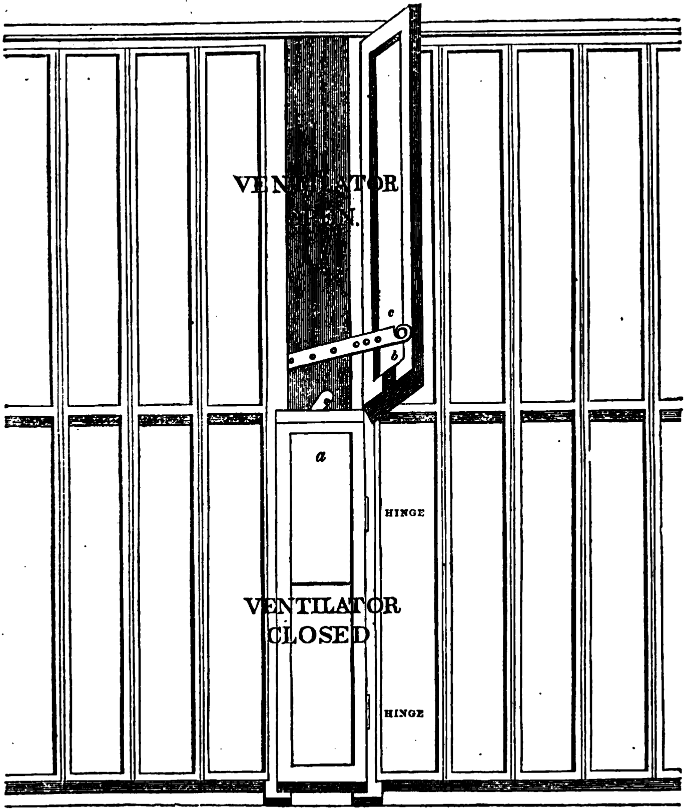
Fig. 9.

The first sash of a lean-to, or pair of sashes of a span, being fixed, the second pair is raised in like manner, and then united on each side by two gauge-bars (Fig. 1), each of which slides into two staples (Fig. 2), screwed on the sides of the styles at about 2 feet from the top, and the same distance from the bottom of the sashes, and this is repeated betwixt every pair of sashes until the whole of the roof is fixed.

The ventilators covering these 9-inch spaces are hinged to the upper edge of the left-hand side styles of the sashes, and shut down one inch over the right-hand styles of the adjoining sashes (Fig. 10), two hinges (Fig. 6) being placed to each half-ventilator, the hooks (Fig. 6) are screwed on the sash styles, and the eyes on the edge of each ventilator.

The catch (Fig. 4) is screwed on the under side of the upper rail of the lower ventilator (Fig. 10, *a*), and the catch-bolt (Fig. 5) on the lower rail of the upper ventilator (Fig. 10, *b*); so that the two portions of the ventilator, when shut down, may be fastened together; and the stay (Fig. 7) opens both at once when desirable. This stay being screwed through the style of the upper ventilator (Fig. 10, *c*), will open it alone,

Fig. 10.



the lower portion remaining closed when the catch is not used (Fig. 10). The ventilating pins are screwed under the right-hand styles of the roof-sashes in such positions as to hold the stays securely by the holes when the ventilators are open or shut.

The ventilators being all fixed, the cap or ridge-board (Figs. 9, *d*, d 20, *d*) is screwed on the top rail of the sashes, so as to fit close to the top of the ventilators when shut; and under the joint thus formed, a small piece of board is slid into grooves made in the side styles of the sashes, so that any water draining through may be conducted to the grooves on the upper edge of the sash, provided for conveying any drip to the gutter below, and under the bottom rail also a similar provision is made. The caps of lean-to houses (Fig. 20, *d*) are bevelled to fit close to the wall, and come down to the ventilators as in span-roofs.

The ends are fixed under the styles of the roof-sashes, and are firmly secured by screwing on the plates (Fig. 3).

The doors are hung in the usual manner, and may be had to open and lock either to the right hand or to the left, as may be desired.

ARRANGEMENT.

The following is a description of some of the uses to which this invention can be adapted and the forms it can be made to assume.

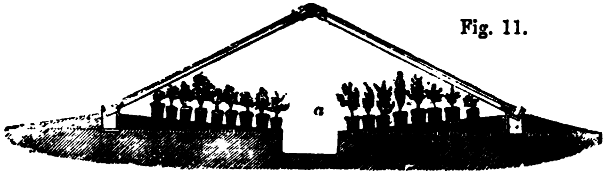


Fig. 11.

The 8 feet sashes, when placed at an angle of 35° (Fig. 11), make an excellent house for bedding out plants, and with suitable heating apparatus, may be appropriated to growing cucumbers, melons, kidney-beans, &c. Fine grapes may also be grown in these 8 feet pits, if good vine borders be made both inside and outside the house. For this purpose ventilators are provided suitable to admit of the vines being taken out in winter, if such is thought desirable.

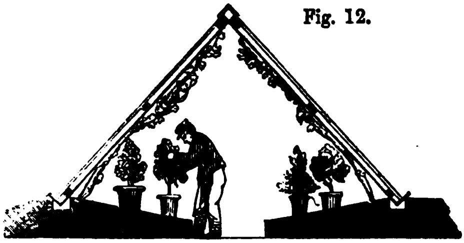
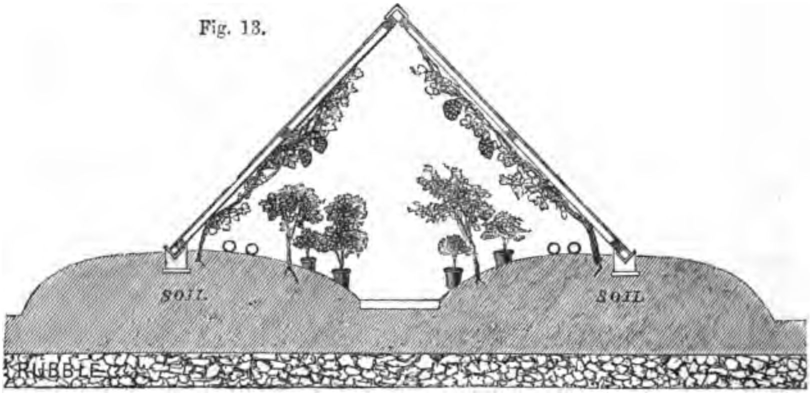


Fig. 12.

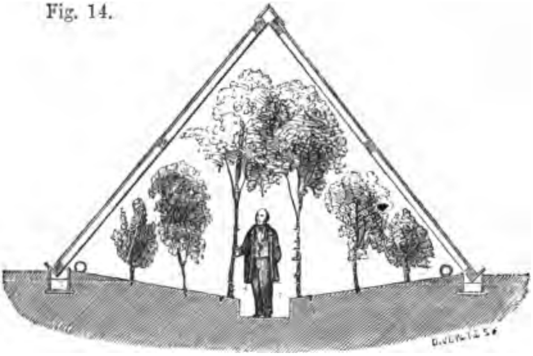
Span-roofed houses composed of 10 feet sashes set at an angle of about 45° (Figs. 12 and 13), giving an internal width of nearly 14 feet, make excellent vineries and orchard-houses; the borders, both inside and outside the house, should be raised high to give a good internal elevation, as in Fig. 13. The fruit-trees may be either grown in pots or planted in the borders, but without heating apparatus, as in Fig. 12, or with a single or double flow and return of pipes as in Fig. 13. These 10 feet sashes, when judiciously erected, form excellent houses at a small outlay, and produce an amazing quantity of fruit.

Fig. 13.



One of the best and most highly recommended span-roofed houses for grapes, peaches and other fruit-trees is composed of 12 or 14 feet sashes, set at an angle of about 45° (Fig. 14). Besides grapes and peaches trained near the glass, standard and dwarf peaches, plums,

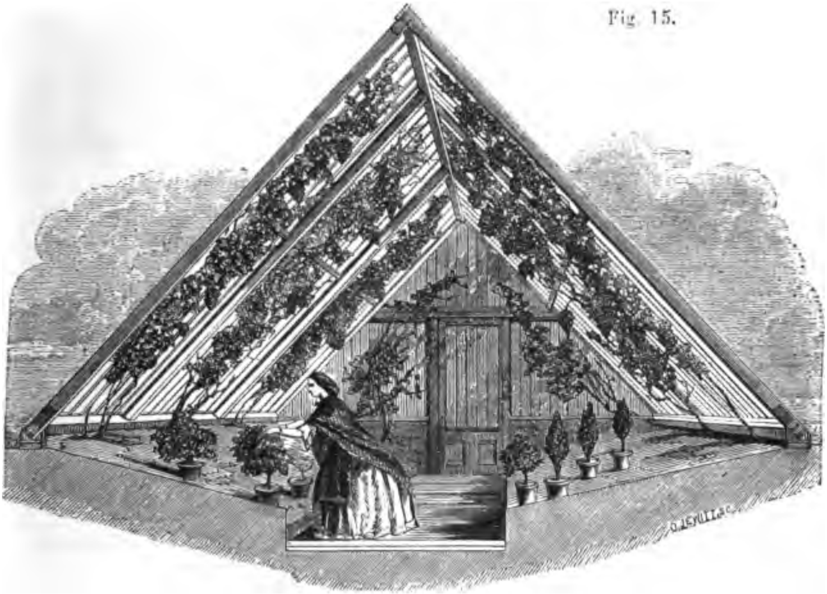
Fig. 14.



cherries, figs and other fruits may be grown in pots or planted out on each side of the walk, and if allowed to grow naturally, they form a grove of fruit-trees loaded with fruit, rendering the house a most profitable, ornamental, and enchanting place of resort. A house of this description in Sir Joseph Paxton's garden at Sydenham produces a most abundant supply of fruit; and the very healthy appearance of the trees and vines are so many proofs that this mode of construction is in thorough accordance with the requirements of the trees.

Fourteen feet sashes fixed at an angle of 45° (Fig. 15) give an internal width of about 19 feet, and 16 feet sashes at the same angle give about 22 feet wide; and by raising the border 3 or 4 feet above the ground level, lofty orchard-houses are formed. The trees as standards being planted on each side of the centre walk, as recommended for the 12 feet sash-spans, their heads will spread over the centre of the house; and if only such pruning be given as is necessary to admit the light into the middle of the trees, a house of this description 100 or 150 feet long with such an avenue of peaches, nectarines, apricots, apples, pears, plums, figs, cherries and other fruit-

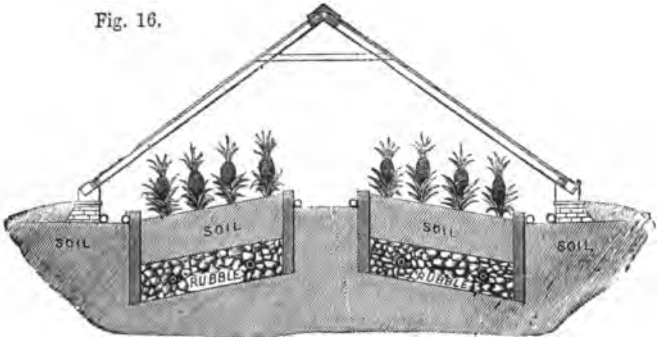
Fig. 15.



trees, and a profusion of grapes hanging over head, combine to give an effect more imposing than can be imagined, and the amount of produce is immense, without the probability of a failure, no matter how unpropitious the seasons may be.

As PINE PITS the 10 and 12 feet sashes are peculiarly adapted when placed at an angle of 30° to 35°; 10 feet sashes give an internal width of nearly 17 feet, and the 12 feet sashes nearly 20 feet. If a walk of 3 feet be allowed through the centre of the pit, and 1 foot 6 inches on each side near the glass for the heating pipes to lie, there will then remain two good pits for pines. Fig. 16 shows the beds on each side, heated with 4 inch pipes passing through a bed of rubble composed of broken brickbats and stones, laid open and loose so as to allow of the diffusion of heat. This rubble chamber should be about 15 inches deep, and if a little long litter be laid over it, the soil will be prevented from falling through amongst the rubble and stopping it up.

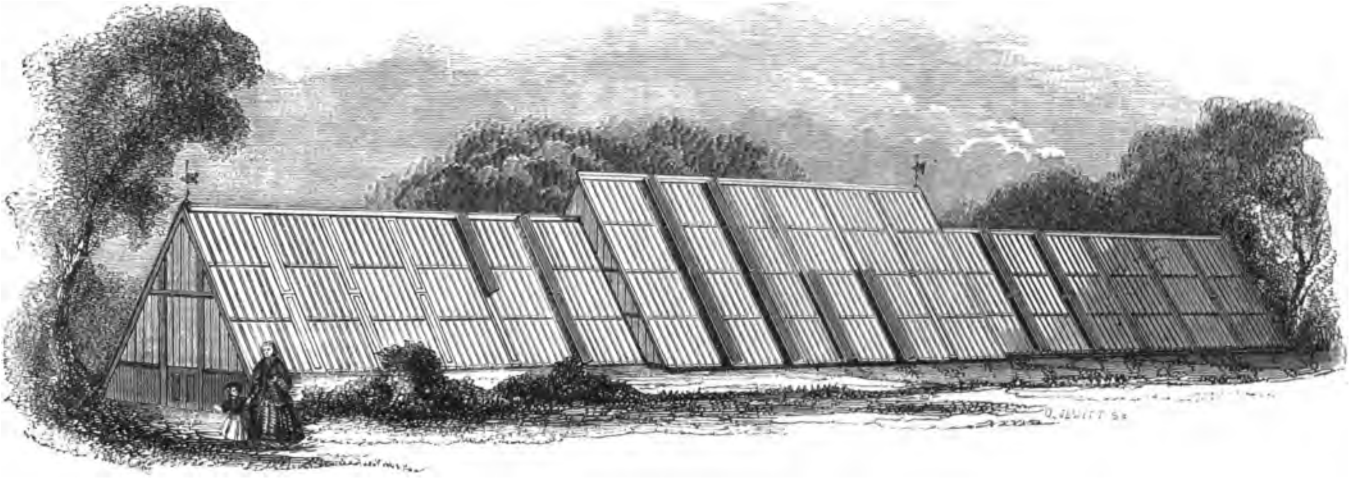
Fig. 16.



Beautiful span-roof ranges may be made by varying the dimensions and arrangements of the sashes according to the purposes for which the houses are intended. Fig. 17 shows a range of three houses, the first a vinery or small fruit-house, the middle an orchard-house, and the third a peach-house, and the general form of the range may be varied, so as to please the taste of the proprietor, and it may be made to show well in an open garden.

As LEAN-TO houses, these sashes form admirable structures at little cost and trouble to all persons who have walls already standing.

Fig. 17.



Fruit-trees may be grown at the back, and vines may be planted in front, and trained on wires near the glass, one vine to a sash. Fruit-trees in pots may be placed in the front of the walk, or bedding out plants may be sheltered through the winter, if no more heat is required than merely to keep out the frost. Where vines are not wanted to be grown, the foot of the sashes may be so placed as to come near the level of the surrounding ground, as in Fig. 18: but when vines are grown, the sashes should be raised by piers on elevated borders as in Fig. 19.

Fig. 18.

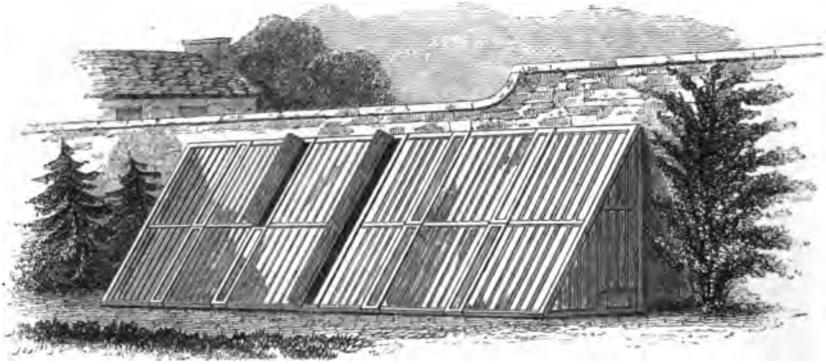


Fig. 19.

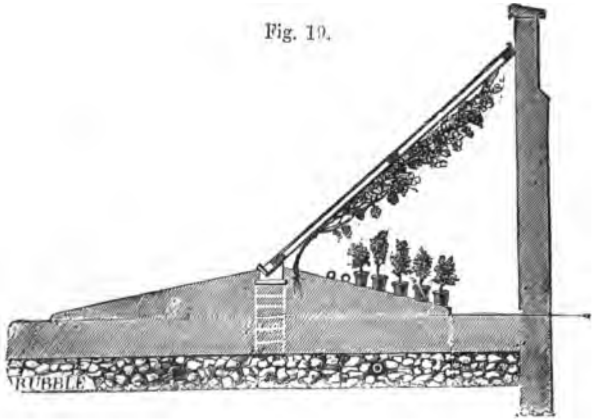
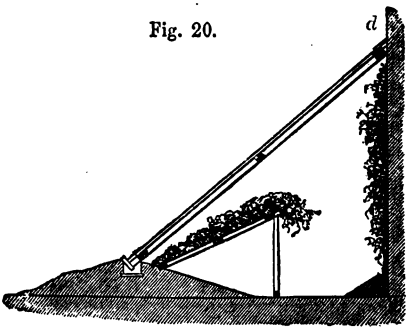


Fig. 19 shows a section of a lean-to vinery, composed of 10, 12, or 14 feet sashes, placed against a wall. The raising up of the front border not only gives more space within, but also having the border made for the most part on the surface, is much better for the vines, and is certain, with proper internal management, to secure good flavoured fruit. The walk is made near to the back wall, and the hot-water pipes should lie on the surface of the soil, about 18 inches from the front; plants in pots (either fruit-trees or other plants) may stand upon the soil; and if space is important, fruit-trees may be trained to the back wall.

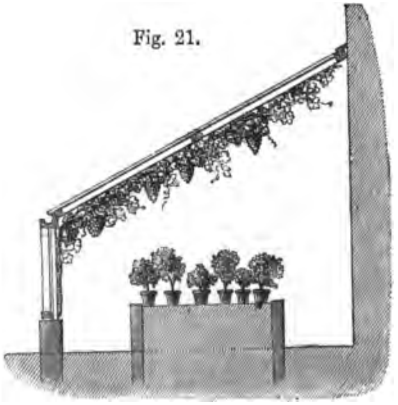
Excellent lean-to peach houses are made with 12 or 14 feet sashes. Trees may be trained to the back wall with the most perfect success; and other peach-trees may be planted in the front border or stand in pots, or be trained part of the way up a front trellis, as in Fig. 20. For a small house of this kind, perhaps the best peaches are the Royal George, Noblesse, and Violette hâtive; and of nectarines, the Elruge, Hunt's Tawny, and Violette hâtive.

Fig. 20.



Lean-to pineries may be made by using 14 feet sashes, which are the size most to be recommended for the purpose, as giving a good internal pit. Twelve feet sashes might be made into an excellent house, but the pit would be narrow for fruiting plants; as a succession house they would do very well.

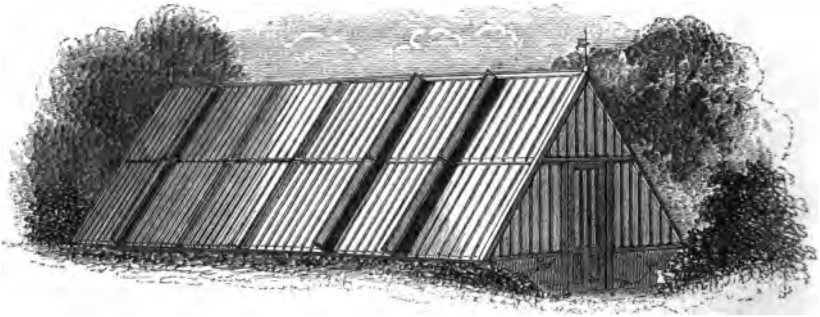
Fig. 21.



If it is desirable to have front sashes, then it is best to adopt rafters and studs, the front sashes being moveable for admitting air, and the ventilation in the roof may be given either by small sashes elevated with irons and cords, or merely by ordinary sliding sashes. Fig. 21 is a house of this description; standard fruit-trees may be planted out in the border, and others in pots may be placed betwixt them, or a brick pit may be built and used for forcing purposes if that is more desirable.

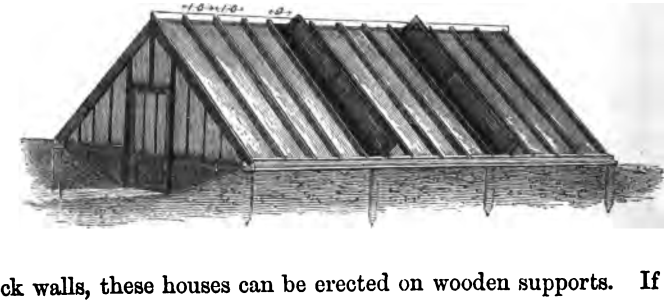
One of the greatest advantages of Sir Joseph Paxton's system is its complete ventilation, especially in span-roofs (Fig. 22). The plants need never be exposed to a direct draught of wind; for if it blows from the east, the ventilators on the west may be opened alone, and if the current is from the west, air can be admitted on the east side. And when the external heat is great, a circulation which in ordinary houses can scarcely be obtained, will, by opening the ventilators, on both sides of the span, render the air always sweet and wholesome. Fig. 22 shows how this can be done.

Fig. 22.



When it is undesirable to adopt either brick or concrete piers or brick walls, these houses can be erected on wooden supports. If only a rough building is required, strong unplaned sash bars, forming

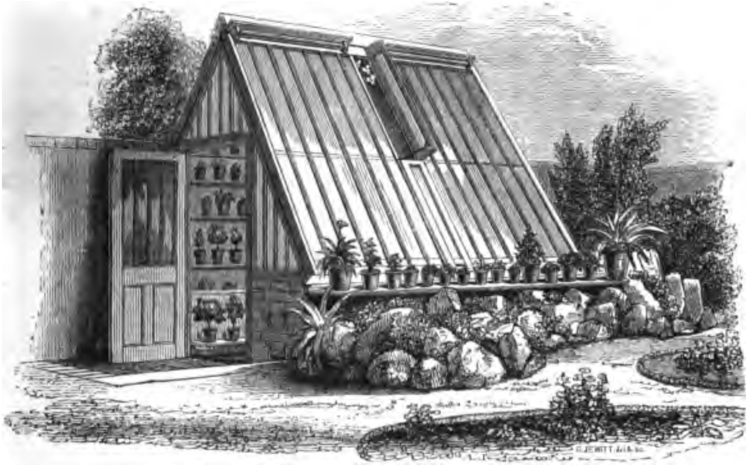
Fig. 23.



rafters, may be fixed and glazed on the place, and with our roof ventilators a very effective span-house is obtained, as Fig. 23, which if not of so neat an appearance as one of our regular span roofs, will cost less, and may be made very productive.

In small gardens, such as many around London and other large towns, where the walls are only about 6 feet high, a very simple half-span roof may be adopted (Fig. 24), heated with a single hot-water pipe, or even with a small flue, and the cost is so trifling, that no one need forego a great pleasure for the sake of the expense.

Fig. 24.

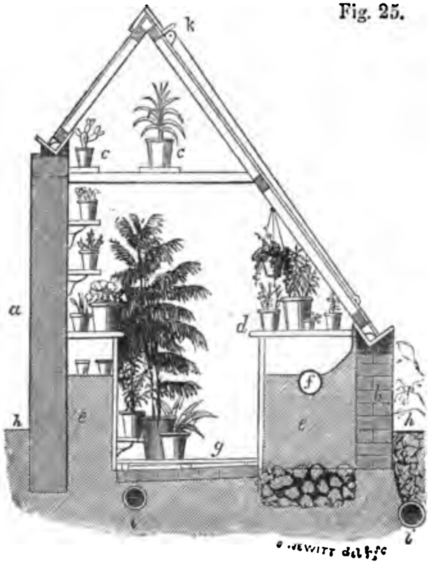


A house of this description we have recently erected in a small garden in the neighbourhood of London. The wall against which this little house is placed, being only 6 feet high, did not allow of sufficient head room, but by the above simple plan a height of between 9 and 10 feet was obtained.

The section (Fig. 25) shows the details of erection—*a*, is the garden-wall 6 feet high; *b*, brick pier to support the frame; *c c*, shelves for succulents; *d*, stage extending along the front and one end; *e*, mould; *f*, flue of circular draining tiles; *g*, floor; *h*, ground level; *i i*, drains; *k*, rollers for blinds; *l*, rock work.

The ground plan (Fig. 26) gives details of the foundation of the little building—*a*, is the fire-place; *b*, *c*, is the flue formed of 8 inch circular draining pipes, those next the fire *b* are unglazed, the others *c* are glazed; *d*, mould, over this is the stage, as shown in the section; *e*, brickwork of fire-place; *f*, brick piers; *g*, garden wall; *h*, drain; *i*, chimney; *Fig.* 2, the chimney of glazed drain pipes.

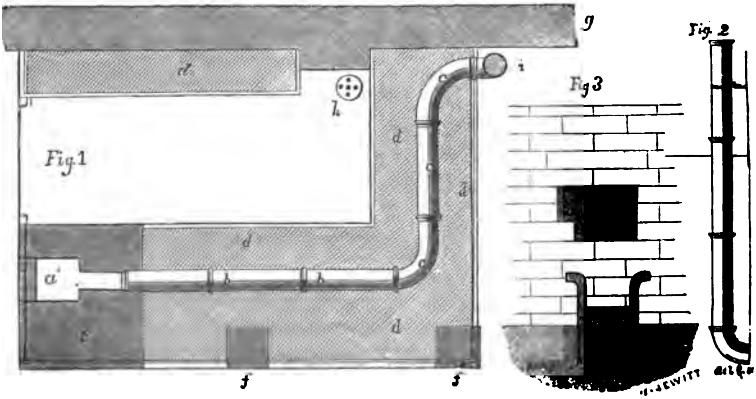
Fig. 25.



Suburban villas sometimes require ornamental structures attached to them. Fig. 27 is a house of this description, which is connected with a plain modern built house and looks exceedingly well.

Fig. 28 is another conservatory of this description which will cost a little more than the last. The top ventilation is given by means of small side sashes fixed in an ornamental lantern at the crown of the roof, and the side lights slide in grooves like those of Fig. 27; the door is a folding

Fig. 26.



one, and the house is quite suitable for the same style of building as Fig. 27.

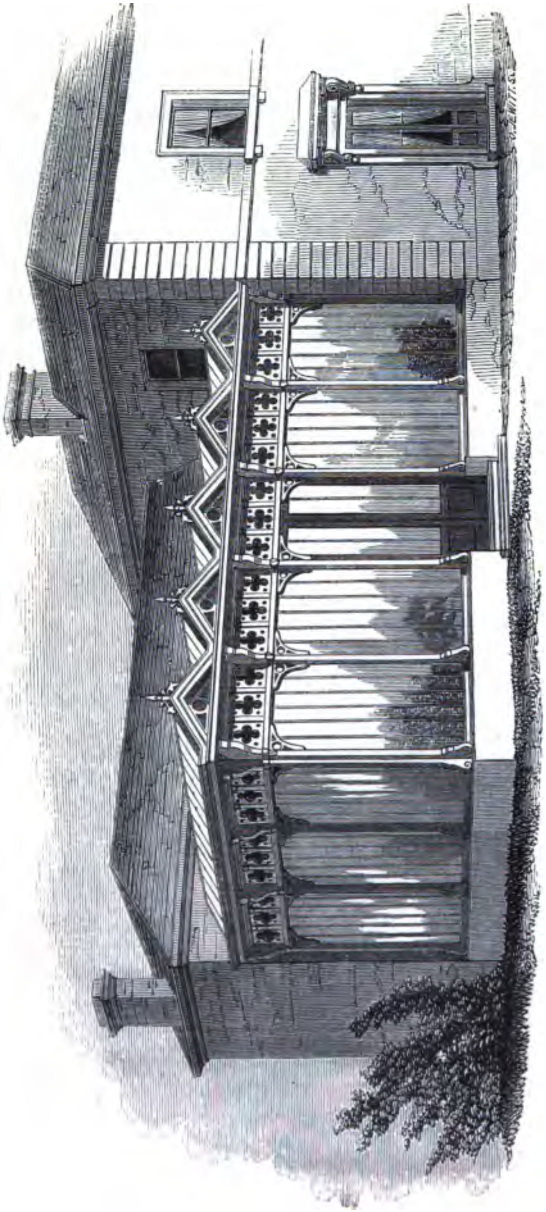


Fig. 27.

Fig. 29 is one of a plainer and cheaper character. The roof ventilation in this case is given by side sashes in a lantern fixed the whole length of the house. This style of structure looks exceedingly well

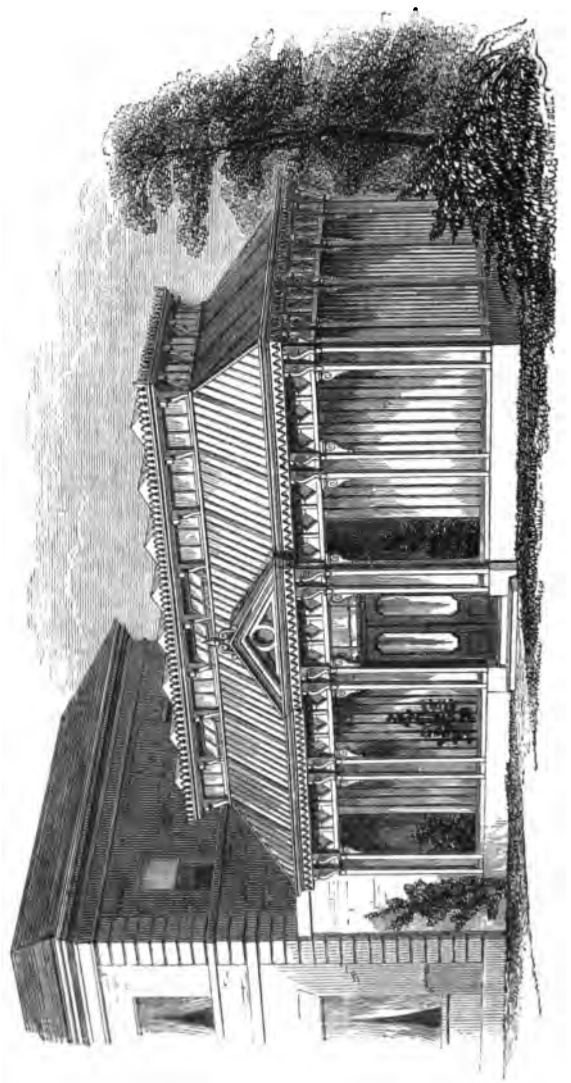


Fig. 23.

when nicely erected, and ornamented a little, and is quite as efficient as those with more elaborate workmanship.

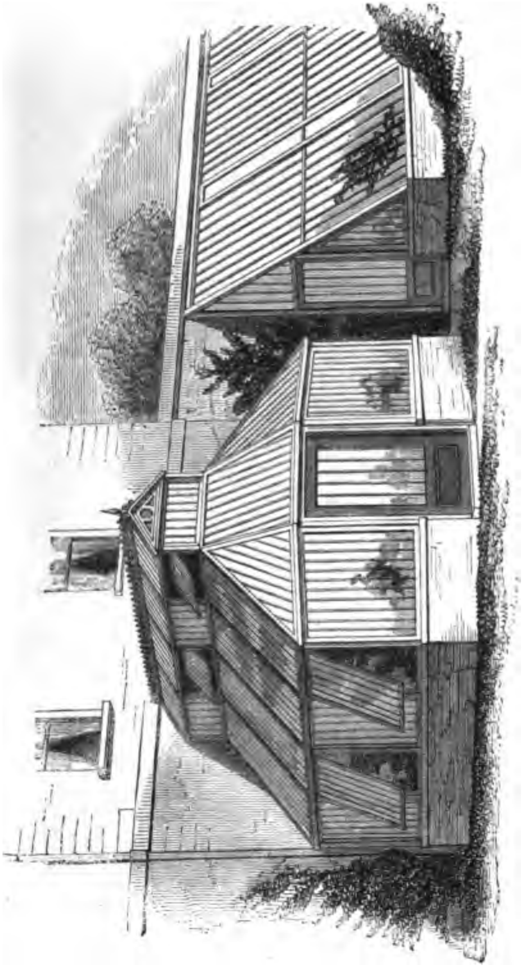


Fig. 29.

Fig. 30 is a small ornamental ridge and furrow structure suitable for an Elizabethan villa; the basement is of stone, the ornaments are all of wood. This style of house is more expensive for its size than any of the others, but it makes a good finish to an unoccupied corner in a villa of this description; and where a drawing-room opens into it, it may be used as an extra room, and yet retain its plants and flowers as a conservatory.

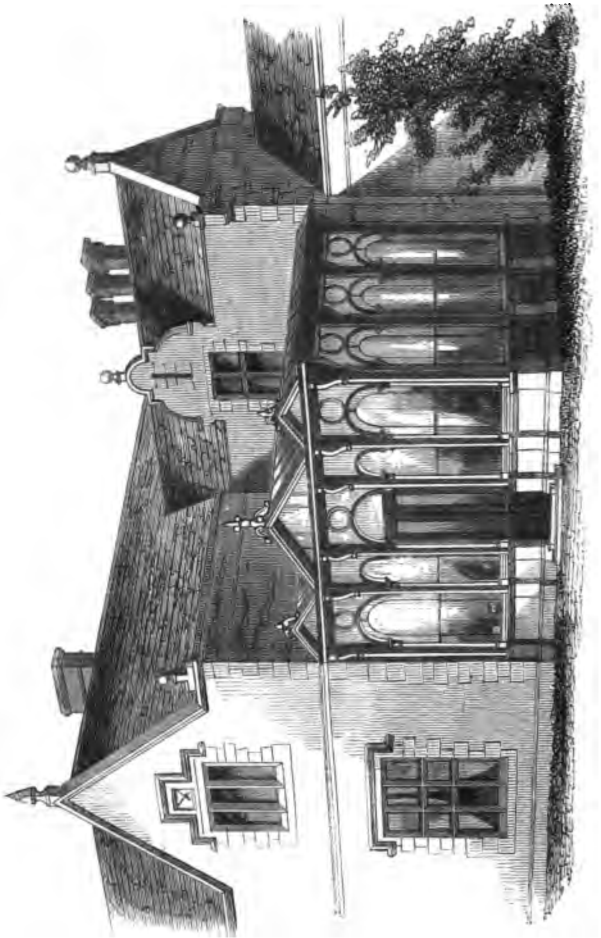


Fig. 30.

Fig. 31 represents a range of about 80 feet in length. The two wings are span-roof fruit-houses, and also may be used for bringing various plants into flower; the centre forms a conservatory 20 feet long for camellias, oranges and other hard-wooded plants, into which fuchsias and other plants may be introduced when in bloom and removed again when out of flower. The span-roof end might be

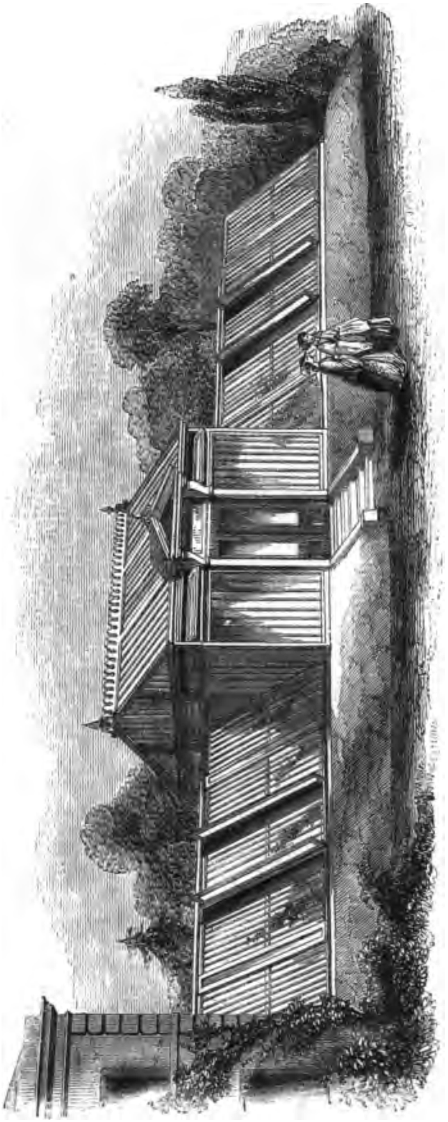
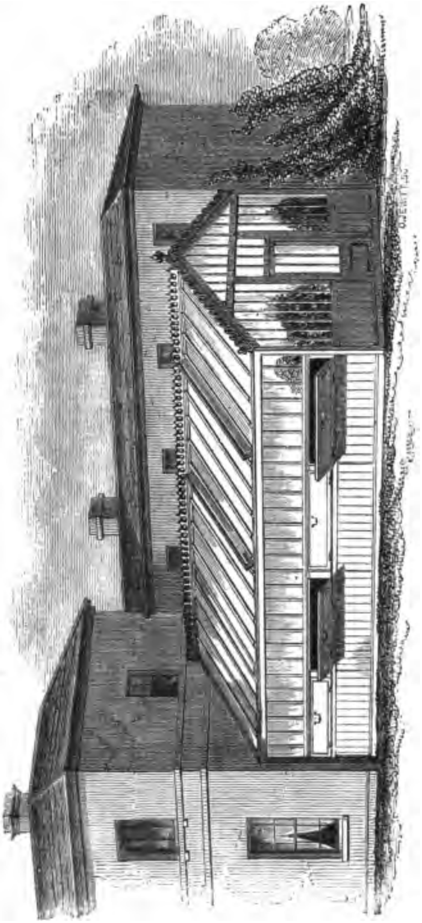


Fig. 31.

connected with the drawing-room window, and so a passage 80 feet long for an interesting morning walk would be secured when the weather out of doors would prevent one being taken. The span-roof connected with the mansion might be made into an orchard-house, and the right-hand wing might be kept a little warmer.

Fig. 32.



Portable houses of a cheap form may be erected against mansions (Fig. 32) which would cost much less than the above; the whole standing upon wooden-charred posts firmly fixed in the ground; lower ventilation is given by wooden shutters, and the roof-air admitted by our ordinary glass flaps. Any amount of ornament can be given that is desired. The side glass is not moveable and the whole is firmly fixed together so as to make a secure conservatory, and at the same time one that can be moved at the termination of a tenancy.

III.—HINTS AND DIRECTIONS ON HEATING HOTHOUSES.

To be able to supply a suitable temperature at all seasons of the year is a matter of great importance. Wherever artificial heat is required, the use of hot water is by far the most genial: the first expense is certainly greater than building common flues, but afterwards the cost is in favour of hot-water pipes, as far less fuel is required to supply the desired heat, and with far more safety. In flues there is always some danger of the escape of smoke and a sulphurous gas, which often does considerable damage, even under the best regulated management.

In glass houses of small dimensions, a common cylinder boiler (Fig. 33) is quite sufficient, with a single flow and return of 4 inch pipes, it will supply heat enough for all the ordinary purposes of fruit culture in a house 20 feet long: for a house 30 or 40 feet long, the saddle boiler (Fig. 34) is more effective. This style of boiler is more easily heated than the last, and if of sufficient size will answer for almost any sized house; either a single or double flow and return may be conducted from it with perfect success. The most effective kind for large ranges, and perhaps one of the best boilers known, is Monro's Cannon

Fig. 33.

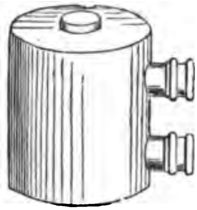
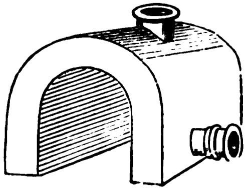


Fig. 34.



(Fig. 35); this kind is easily managed and does not often get out of order: if of a large size, the one boiler system may be followed, with

Fig. 35.

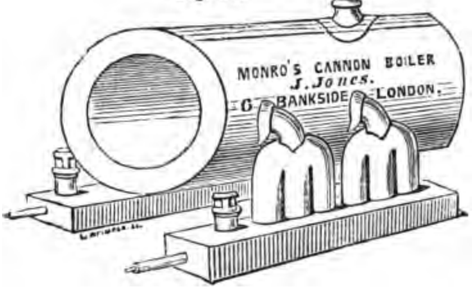
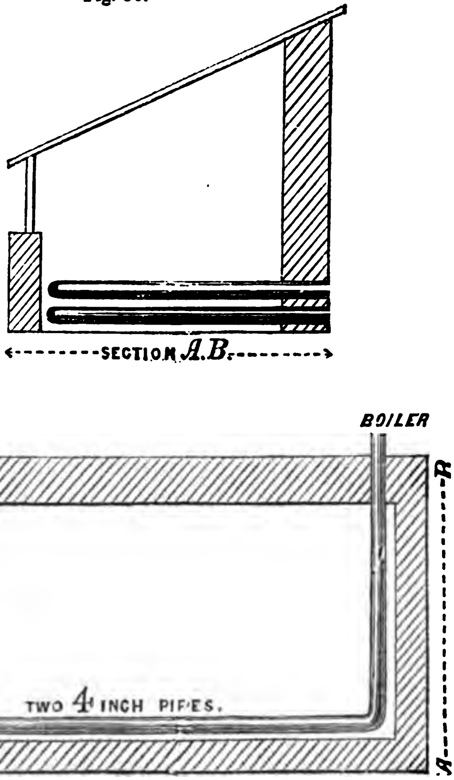

MONRO'S CANNON BOILER
J. Jones.
6 BANKSIDE LONDON.

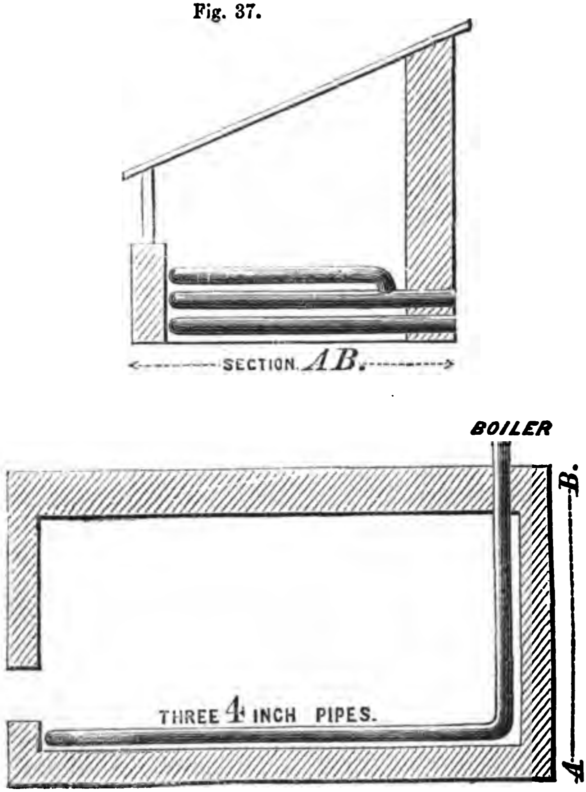
Fig. 36.



stop taps and valves fixed in different parts, to turn on or off the heat as desired. The whole of these boilers may be procured of Mr. Jones, 6 Bankside, London.

Where a house requires only a sufficient heat to ripen the fruit in dark wet weather, or to mature the wood of the vines and fruit trees, and to start them into growth a little earlier than the open air season in spring, a single flow and return of 4 inch pipes will be sufficient (Fig. 36), but in houses where earlier products are required, a double flow and a single return may be laid as in Fig. 37. In span-roofs, where a good heat is a desideratum, a double flow and return passing round should be supplied, otherwise a sufficient command will not be gained, Fig. 38. Lean-to houses having pits for forcing purposes

Fig. 37.



(Fig. 39) should have a flow and return laid through the rubble of the pit, and another flow and return either carried by the side of the walk, or, what is better, passed near the front by building the pit a little nearer the back wall.

Fig. 38.

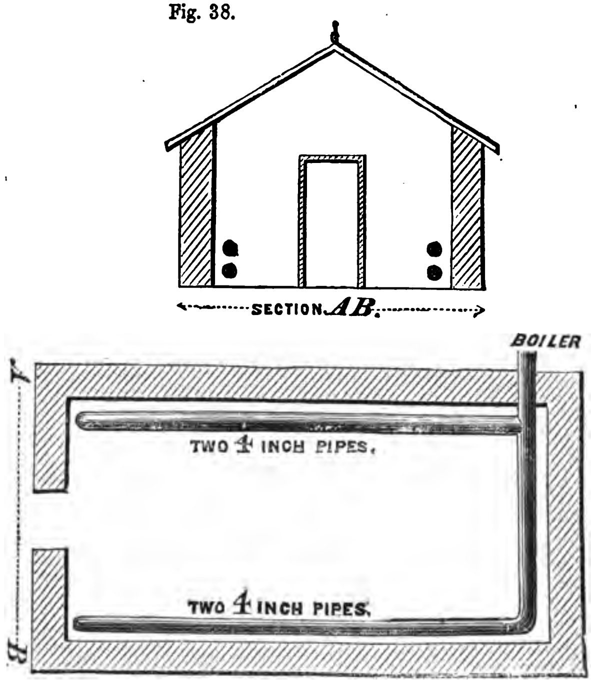
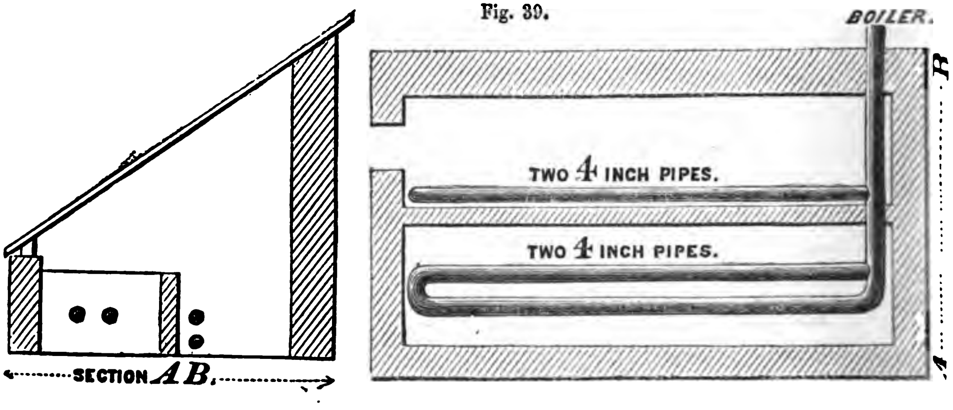


Fig. 39.



IV.—HINTS ON THE CULTIVATION OF VARIOUS FRUITS AND VEGETABLES SUITABLE FOR FORCING AND ORCHARD HOUSES,

CULTIVATION OF MELONS, KIDNEY BEANS, &c., IN EIGHT FEET SPAN HOUSES.

In the 8 feet sash span-roof, Fig. 11, kidney beans may be sown in pots for planting out in the borders of the house when the bedding out plants are removed, or they may be grown to maturity in pots, and be so arranged as to admit of the planting of melons. Perhaps the best kidney beans for forcing are Fulmer's Early, Mohawk, Newington Wonder, and the long-podded Negro, these will keep up a succession.

The kinds of melons suitable for such a situation without bottom heat, are :—

American Ridge.—The fruit is rather small, but is produced in great quantities, the flesh is orange-coloured, very juicy, highly flavoured, and ripens to the skin.

Onion.—This is a green-flesh of excellent flavour, exceedingly prolific, and ripens like the last to the skin.

Haddo House.—Another green-flesh deeply ribbed and netted, of good flavour, and is produced in abundance.

Cuthill's Improved Scarlet Flesh.—This is another valuable kind, of good flavour, and a great bearer.

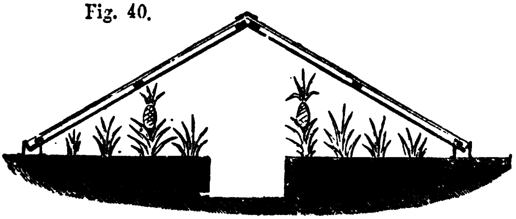
If the pits admit of heating by hot-water or by fermenting materials, then *Carter's Excelsior*, a beautiful green flesh, and *Turner's Gem*, a bright scarlet flesh, may be added to the list, and will not disappoint the cultivator.

The culture of these kinds of melons is so simple, as scarcely to require any detailed explanation. A rich mellow loam mixed with a small portion of very rotten dung is the best compost; the loam should be the top spit from a pasture where sheep have fed, and if mixed with the manure and thrown together at the beginning of winter, so that it may be well broken by frost, and be turned now and then, it will be rendered all the more suitable. When the plant-hills are intended to be made, take out the ordinary soil so as to make a round hole about 2 feet in diameter and a foot deep; fill this with the prepared mould, raising it about a foot above the ordinary level; make the whole pretty solid, so that it will retain moisture; plant out the melon plants, which have been previously grown in heat and gradually hardened, and train and stop them in the usual way.

CULTIVATION OF THE PINE-APPLE, WITH A SELECTION OF KINDS.

For the culture of pines, lay upon the rubble beds (Fig. 16) about 15 inches deep of fine light soil, in which, when sufficiently warmed, the pine suckers may be planted. Their growth will be most rapid (very unlike plants grown in pots), and in the course of 12 or 15 months, from the sucker they will send up fine well formed fruit. The culture simply consists in attending to a proper regulation of the bottom and top heat, and watering the plants when they require it. After the fruit is cut, leave the old stools in their places until the suckers are sufficiently large to be separated, then throw away the old stocks, remove the soil in which they grew, and replace it with new mould; carefully take up from the succession pit (Fig. 40) fine grown suckers to supply the vacancies; in a few months these too will show fruit, and so in their turn will be replaced by others; by this means a constant succession of fruit will be produced all the year. All cultivators of the pine-apple have their favourite kinds; with these preferences we do not wish to interfere: amongst those, however, most desirable, may be mentioned the *Lemon Queen*, a fruit of fine growth, possessing a rich vinous flavour, and ripening at all seasons of the year. The ***Ripley***

Fig. 40.



Queen is another good kind, bearing a large handsome fruit, also highly flavoured, and swells well during both winter and summer. The *White Providence,* although requiring much room, yet cannot very well be dispensed with, as its fruit grows to a large size (and when planted out) is produced in a short time. The *Cayenne* is without exception one of the very best, both for flavour and for shortness of time required for it to produce its fruit; it is an admirable kind for winter.

Grapes may also be grown in these pits by wintering the vines outside. For this purpose a slide is provided at the bottom of each ventilator, which admits of removal, so that the vines can be drawn through and secured on the outside, while a slide of wood is fixed in the opening, and a box placed inside the house to prevent the entrance of cold and wet passing into the house.

CULTIVATION OF ORCHARD-HOUSE TREES.

It is not necessary in this little work to enter into a long detail of cultivation, but the following brief remarks and the appended lists may not be without their use. The kinds of fruits marked with asterisks would be suitable where only a few of each kind are required.

APPLES.

Apples set better and bring larger crops when no fire heat is used; if they are planted out in the borders, therefore, or are grown in pots in houses artificially heated, place them in as cool and airy situations as can be provided. If proper attention is paid to watering, air, and mulching, their crops may be considered certain with very little trouble.

Selection of Apples for Orchard-Houses.

Aromatic Pippin.—Very rich fruit; tree a great bearer. Table.
*Blenheim Orange.—One of the best kitchen apples. Kitchen table.
Braddick's Nonpareil.—A great bearer; ripens in winter. Table.
*Carlisle Codlin.—An excellent culinary Apple. Kitchen.
Cornish Gilliflower.—A sweet and pleasant fruit. Table.
Court of Wick Pippin.—A first rate table fruit; great bearer. Table.
Court Penduplat.—A great bearer; good flavour. Table.
*Downton Pippin.—Very like the Golden Pippin; excellent. Table.

DUTCH CODLIN.—A rich fruit for Autumn use. Kitchen.
EARLY HARVEST.—A very rich and excellent fruit. Table.
FEARNE'S PIPPIN.—Tree a great bearer; fruit fine. Kitchen.
GOLDEN HARVEY.—Tree an abundant bearer; fruit rich. Table.
HAWTHORNDEN.—One of the best kitchen fruit. Kitchen.
***IRISH PEACH.**—A great bearer; fruit sweet and aromatic. Table.
***KERRY PIPPIN.**—An Irish table apple of superior quality. Table.
***KESWICK CODLIN.**—The earliest kitchen apple; fruit fine. Kitchen.
MANK'S CODLIN.—A great bearer, and an excellent fruit. Kitchen.
***MELON.**—Delicious, melting, and very juicy. Table.
NONSUCH.—Tree a good bearer; fruit fine for jelly. Kitchen.
NORTHERN SPY.—Fruit large; a valuable American kind. Table.
SAM YOUNG.—A fine large fruit, of good flavour. Table.
SUMMER GOLDEN PIPPIN.—Finer fruit than the old Golden Pippin. Table.
***WHITE JUNEATING.**—Small; very early; and fine flavoured. Table.
WELLINGTON.—A long-keeping fruit; tree bears well. Kitchen.

APRICOTS.

APRICOTS require upon the whole much the same treatment in an orchard-house as peaches and nectarines, but they are more impatient of heat, and must be placed so as to have as much light as possible; with abundance of air and light, and a cool temperature, they are easily managed, and are exceedingly prolific: if kept too warm the leaves immediately turn yellow and the fruit is flavourless.

Pruning.—When the young shoots push out in spring, and become two or three inches in length, the trees require to be gone over. There are generally two or three shoots produced together from the previous year's wood; only one must be retained, and the others rubbed off. The young shoots which are bearing should be stopped a few joints above the fruit, which will by this means derive a larger degree of nourishment than would be supplied if all the shoots were allowed to proceed undisturbed.

Insects and diseases.—The apricot seldom suffers in orchard-houses, from either insects or diseases, if kept in vigorous growth, by judicious watering, plenty of air, and not too much heat.

SELECTION OF APRICOTS FOR ORCHARD-HOUSES.

EARLY ORANGE.—Early, and a good bearer, but fruit small.
***HEMSKIRKE.**—Resembling the Moorpark, but earlier and larger.
***MOORPARK.**—A first-rate old kind, exceedingly rich.

Musch-Musch.—Small fruit, but comes in early, and a great bearer.
Royal.—A large handsome fruit, rich, and very juicy.
Turkey.—Large; tree a great bearer; ripens late.

CHERRIES.

The same soil is suitable for Cherries, whether in pots, or planted out in an orchard-house, as that recommended for peaches and nectarines; but with a little lime rubbish mixed through, as recommended for figs. The treatment of these trees is much the same as for peaches, except that more air is required, and they seldom set well when grown in a house, unless carefully fertilised. This may be done by touching the centre of each flower with a camel hair brush, or by giving the trees a sudden shake (not too much), just at the time when the pollen is dry and will readily fly about; a brush is the best where it can be done. They must not be hurried forward when in bloom, either by liquid manure or extra heat, but after the fruit is set, a little thin liquid manure twice or three times a week, if grown in pots, will greatly assist them. The time of stoning is another very critical period; if urged on in the least by either stimulants, liquid manure, or by heat, they are sure to fall, and leave a very thin crop to ripen.

Insects and diseases.—The cherry is not liable to suffer much from diseases, being of a robust constitution, but the extremity of its shoots are often sadly infested by the black aphis (Aphis Cerasi), which is generally considered difficult to extirpate. If Gishurst's compound be mixed with clear lime and soot water, and the trees be syringed with this liquid, the insects will disappear as if by magic, and the liquid will give the trees such vigour that they will scarcely be attacked again that season.

Selection of Cherries for Orchard-Houses.

*Bigarreau Gros Cœuret.—Excellent; one of the finest of this class.
Bigarreau.—White fruit with red blush; a great bearer.
*Black Circassian.—One of the finest black cherries.
Black Eagle.—Rich fruit; tree a great bearer.
Bowyer's Early.—Ripens early; a good fruit, but small.
Downton.—One of the very best cherries, and tree a great bearer.
Early Amber Heart.—Rich and sugary fruit; ripens early.
Empress Eugenie.—A new cherry; well worth cultivation.
*Jeffrey's Duke.—Tree grows compact; bears well in a pot.
*May Duke.—An old and first-rate fruit.

FIGS.

Figs require a rich loamy soil, mixed with one-fourth rotten dung, and a little lime rubbish. If planted out in a border of the house, lay a good bed of rubble beneath the border, or the roots will get down deep, and no management will bring a supply of good fruit. They can scarcely be supplied with too much water when in a state of growth; some kinds require a deal of air, and bear better where they have not much artificial heat,—of these are the Brunswick, Black Ischia, Early Violette, D'Or, and Green Ischia. Others may be forced to almost any extent without danger of losing the crop,—of these are the Black Marseilles, Lee's Perpetual, White Ischia, and White Marseilles. If grown in large pots they will bear an amazing quantity of fruit; they require, however, to be kept well supplied with water at the roots, and about twice a week during the whole season of growth, they should receive a good soaking of thin liquid manure.

Pruning in summer merely consists in stopping with the finger and thumb each growing shoot to about 6 or 7 eyes; fruit will then be produced at the axil of each leaf, and as lateral shoots again grow, each may be stopped at three eyes, and these will also produce fruit at each axil as before. By this means a constant succession of fruit will be ripened until late in the season, and the bushes will grow very compact, and will occupy but a small space.

Insects and diseases.—Figs rarely suffer from either if properly managed; and if they receive proper nourishment will continue in health, vigour, and fruit-bearing, for very many years.

Selection of Figs for Orchard-Houses.

Black Ischia.—Does not bear much heat; a good bearer.
*Black Marseilles.—Small; a great bearer, and good forcer.
*Brunswick.—Brown. One of the very best for an orchard-house.
D'Or.—Large fruit; yellow; a great bearer.
Early Violette.—Small; a great bearer; rich and sugary.
Green Ischia.—Small; amber colour inside; delicious flavour.
*Lee's Perpetual.—Brown; large size; exceedingly prolific.
White Ischia.—Small; white; very delicious, if kept a few hours after being gathered.
*White Marseilles.—Middle-sized fruit; a first-rate forcer.

GRAPES.

Border.—The best soil for a productive vine border is composed of one-half good turfy loam (the top spit from an old pasture with the sods), one-eighth very rotten horse-dung, one-eighth rotten cow-dung, one-eighth road scrapings or lime rubbish, and one-eighth leaf mould, or, if this last cannot be got, a light sandy soil; and for an extra stimulant a little bone-dust. The depth of a vine border should be in some measure regulated by the nature of the subsoil, and the general temperature of the district. If the subsoil is a cold clay and damp, the border should never exceed 2 feet 6 inches deep, and should as much as possible be raised above the surface of the ground level: if, on the contrary, the subsoil be hot and dry, the border might be made 3 feet in depth, and a foot or 18 inches might, if desirable, be below the surface of the surrounding ground. Formerly all borders were recommended to be made 4 or 5 feet deep, but no roots scarcely reached lower than 2 feet 6 inches or 3 feet, and they were then usually weak and of little value; all the useful roots run within 18 inches or 2 feet of the surface. Broken bricks, stones, or any other hard rubble, should be laid under the border, and the ground sloped to the front, so as to allow of a good drainage; if made through the house, the border need not extend beyond 10 feet outside, and it should always be made to slope as shown in Figs. 12, 13 and 19.

Planting-out Vines.—As the plants are grown in pots, if they are carefully turned out without damaging the roots, planting may be done at any time of the year; it is preferable, however, to do it either in the autumn, so as to allow of the roots establishing themselves before the vine goes to rest, or, which is best, in spring, when the plant starts at once and forms a rod without delay.

When very early grapes are required from planted-out vines, bottom heat to their roots is of immense advantage. This is obtained by carrying pipes through the rubble beneath the vine border: the rubble bed in this case is made a little deeper.

Vines in pots.—Two-year old plants are the best to select for producing fruit in pots: in pruning, shorten them to 10 or 12 eyes, according to the strength of the cane. When in full growth, water must be liberally supplied to the roots, with very thin liquid manure once or twice a week, but it must be given with judgment or it would do injury. After the vines have done bearing, the leaves begin to change colour, and the wood ripens, the plants should be then removed out of doors to a good sunny place, and the pots be well mulched with long manure, to prevent the sun from injuring the roots, or the soil becoming too dry. The wood will then harden, and the plants will go into a state of perfect rest, by which they will be again prepared, at the proper time, to be introduced to their places of growth.

Ripening the wood of planted-out vines is most important. If the autumn is wet and cold and the wood is not perfected, give a little artificial heat, and open the ventilators so as to admit of as much fresh air as can be supplied, and by keeping the house pretty dry the leaves will soon fall; then keep the house cool and airy, so that the winter's rest may be as perfect as possible.

Pruning.—Train up only a single rod to each sash the first year after planting, and pinch off the end when it reaches the top of the house. Train in the other shoots to the wires, stopping them at about 4 or 5 eyes, and the laterals which start from this stopping should also be pinched off at one joint as they put out; this is best done by the finger and thumb. At the winter pruning cut these side shoots into spurs of about 3 eyes, and shorten the leading shoot to about 10 eyes long. In the next year's growth train a young shoot from the lowest spur to about half the length of the rafter, and in the following winter's pruning convert the first rod into spurs, and leave the young rod also to bear; this young shoot will probably be required to replace the old spur rod. This plan may be continued in succession, but never allow more than one spur rod and one young bearing rod to a vine, or the shade will be too great to allow of the fruit trees beneath producing.

Grapes may be preserved hanging on the vines until the following April, provided no greenhouse or bedding-out plants are sheltered in the house, as a cool dry air is indispensable. That this may be secured at all times, if the weather is frosty, wet, or cloudy, make a little fire in the house, and give air, so that any damp vapours may escape. Always keep closed up at night, to keep out the night dampness: in sunny weather give plenty of air. By these means West's St. Peter's, Morccco, and other late kinds, will hang and retain their flavour until April. The Bowood Muscat is usually considered a tender grape, but it produces fruit of a good quality in a house without artificial heat. To grow the Muscat Hambro' to perfection, a house where fire heat can be supplied is best; in such a house it is a most abundant bearer, the bunches are well formed, and it rarely shows signs of shanking.

Selection of Grapes for Orchard-Houses.

*Black Frontignan.—Black.
Grisley Frontignan.—Pale Red. } Excellent grapes, with rich Muscat flavor.
White Frontignan.—White.
*Black Hamburgh.—Black. One of the very best black grapes known.
*Golden Hamburgh.—Yellow-white. Bunches large, with good flavour.
Royal Muscadine.—White. Early and good.
*Buckland's Sweetwater.—White. Very fine bunches, and very sweet.
Muscat Escholata superba.—White. The finest Muscat; requires less fire than Muscat of Alexandria, and bears larger bunches.
Muscat Hamburgh.—Black, and of very high flavour.
Dutch Sweetwater.—White. Very early and hardy.
Trentham Black.—Black. A very good grape ; large bunches.
Black Prince.—Black. A very good bunch, rather thick skinned.
*West's St. Peter's.—Black. One of the best late grapes; will hang till March without shrivelling.
Lady Downes.—Black. Will hang till March without shrivelling.
Dutch Hamburgh.—Black. Like the Old Hamburgh, but thicker skin.
Frankenthal.—Black. Almost like the Dutch Hamburgh.
Burkhardt's Amber Cluster.—White, with amber colour on sunny side. Bunches large and fine.
Fleming's Prince.—Black. Almost like the Black Prince.

PEACHES, AND NECTARINES.

Peach and Nectarine trees thrive well in the same kind of border that is made for vines, and it is requisite to lay a quantity of hard rubble or strong gravel beneath the border to prevent their roots running down. In a span-roof orchard-house plant the trees on each side of the centre walk, at a sufficient distance from the walk, that the branches will not be in the way of a person passing through the house, and at a sufficient distance from the sides of the leaning roof to allow of their free growth. If every other tree was either a standard peach, or nectarine, or plum, there would be a perfect grove, and when in fruit they would have a most enchanting effect. If the plants are removed from pots, which is advisable, they may be planted out early in spring, and a crop of fruit will be borne the same season. Where it is desirable to train them to a wire trellis near the glass, about a foot should be allowed betwixt the glass and the trellis; if this rule be followed, however, a less variety of fruit can be grown on the soil beneath, as nearly the whole of the ground would be darkened and unfit for cultivation. The most profitable method is to grow them as dwarf and standard bushes, and train vines, one rod up the centre of each sash to two or three wires, so as to allow abundance of light below, for the growth of fruit in every available foot of ground surface.

In the season of growth, peaches and nectarines require a low moist temperature, and a dry air with plenty of ventilation when in flower, and until the fruit is set; 55° by day and not more than 45° by night may be considered an average heat, and syringe daily until the flowers are open, and after the fruit is set.

Artificial fertilization must be performed by means of a camel hair brush; and if the air of the house is very stagnant, give the trees a sudden shake to distribute the pollen.

When the fruit is set and has become sufficiently large to be certain that it will stand, thin it out, but take care to leave at least one-fourth more than it is intended the trees should carry, as at the time of stoning many may fall. Now give plenty of water to the roots if required, and syringe every fine day; remove any superfluous wood, so as only to leave as much as will be required to keep the trees well clothed and balanced, and stop those fruit-bearing branches not required to grow to their full length at about two joints above the fruit. The temperature may now be raised to 65° or 70°, with sun heat, but in dull cloudy weather it is not well to raise it higher than 60°.

When the fruit is stoning decrease the heat, give plenty of air, and allow no sudden changes of temperature to affect the trees, or most of the fruit will fall. After stoning is over, thin out all superfluous fruit, stop the lateral branches at one joint, and increase the heat gradually to encourage them to swell up; syringe early in the morning and at shutting-up time, and give air all the day freely. When the fruit is ripening give abundance of air, cease syringing, and keep the house rather dry. If at this stage the planted-out trees require water at their roots, let it be given in the morning, that the moisture may escape during the day; do not give a great heat, or the flavour of the fruit will be deteriorated. Air and sunshine are the principal causes of good flavour.

When the leaves are all off and the wood well ripened, which will be in September or October, pruning may take place. Before they are started again all superfluous branches may be cut out, and weakly shoots shortened to a good wood-bud. The young branches had better be left rather thin than too crowded, as much better fruit is produced.

Trees in pots require a similar treatment to those planted out; only a little thin liquid manure should be given about twice a week when the growth is required to be urged on.

It is always well to have a surplus of peach trees in pots, and the best can then be selected for early work.

Never allow trees in pots to be overloaded with fruit, as the fruit will be smaller, and the trees will be injured for another year.

Insects and diseases.—If the weather outside in spring is cold and harsh, or at the time the fruit is setting, and the growth cannot be urged forward, the trees are often attacked with the aphis; Gishurst's compound should be used, mixed with clear lime and soot water.

When the fruit is ripening it is not uncommon for the red spider to make its appearence, if the weather is hot and dry. To check this, mix a quantity of sulphur into a paste with water, and paint over the hot-water pipes, or over slates and tiles, and place them in different parts of the house, and the sun will cause the fumes to rise from them and the insects will be banished.

Mildew sometimes appears if the weather is dull and wet; dust the leaves with sulphur, but be careful not to scatter it on the fruit. Mildew seldom attacks during the time of ripening.

As liquid manure for all trees in pots, perhaps sheep and fowl's dung are amongst the best; but when these cannot be obtained the drainings of a dunghill may be used, but it must be diluted until it is merely a slightly coloured water.

Top dressing with very rotten manure is also of great value in the culture of fruit trees in pots.

SELECTION OF PEACHES FOR ORCHARD-HOUSES.

BARRINGTON.—An excellent fruit, and tree a great bearer.
BELLEGARDE.—Quite equal to the last; may be forced without danger.
BERGEN YELLOW.—A fine yellow-fleshed fruit; bears well in a pot.
CRAWFORD EARLY.—A delicious fruit, with yellow flesh; like an apricot.
*EARLY YORK.—Perhaps one of the finest early peaches we have.
GROSSE MIGNONNE.—Rich, with a peculiar flavour; an excellent forcer.
*NOBLESSE.—Very luscious; hardy; a great bearer, and good forcer.
*ROYAL GEORGE.—Large fruit; one of the best for forcing.
SOLWAY.—A new kind, with flesh like an apricot; very rich.
TESSIERS.—A French kind; is excellent for pots; fruit 9 or 10 inches round.
*VIOLETTE HÂTIVE.—Large and handsome, with a violet tint on sunny side; one of the finest in cultivation.

SELECTION OF NECTARINES FOR ORCHARD-HOUSES.

*ELRUGE.—An excellent forcer, and a first-rate fruit.
FAIRCHILD'S EARLY.—Small, almost like an apricot; a good orchard-house tree.
HUNT'S TAWNEY.—A great bearer, and a good forcer.
MURRAY'S.—A good forcer, and an excellent fruit.
NEW WHITE.—An excellent fruit, of splendid flavour, but rather tender.
PITMASTON ORANGE.—A very handsome fruit; tree a great bearer.
*VIOLETTE HÂTIVE.—A great bearer; fruit large; tree bears forcing well.

PEARS.

The same rule may be followed with pears as with apples, they rarely require pruning. If their roots are confined in 18-inch pots, and a sufficiency of nourishing appliances given, their excessive fruitfulness prevents a too luxuriant growth, and they naturally assume compact fruit bushes, loaded with beautiful fruit.

Insects and diseases seldom attack either apples or pears when grown in orchard-houses.

SELECTION OF PEARS FOR ORCHARD-HOUSES.

*AMBROSIA.—An early pear; rich, sugary, and melting. Table.
BERGAMOT DUSSART.—A delicious fruit. Table.
BEURRE DE CAPIAUMONT.—A great bearer, and good flavour. Table.
BEURRE DIEL.—Excellent melting fruit; tree a great bearer. Table.
*BEURRE LANGELIER.—Very good fruit; does well in orchard-houses. Table.
BROOM PARK.—Possesses a peculiar flavour. Table.
BROWN BEURRE.—An old, but fine, melting fruit. Table.
DOYENNÉ D'ETÉ.—Fruit small; very early, and good flavour. Table.

DUCHESSE DE MARS.—Tree a great bearer; fruit sugary. Table.
***DUCHESSE D'ORLEANS.**—Bergamot flavour; very delicious. Table.
GLOUT MORCEAU.—One of the very best melting pears. Table.
JARGONELLE.—On old and unsurpassed kind for flavour. Table.
LOUISE BONNE.—An excellent kind for pot culture. Table.
***MARIE LOUISE.**—An excellent kind for pot culture, and good bearer. Table.
PASSE COLMAR.—Highly flavoured, and tree a great bearer. Table.
VAN MONS LEON LE CLERC.—Excellent, and good bearer. Table.
WILLIAMS'S BON CHRETIEN.—Fruit luscious, and a great bearer. Table.
WINTER NELIS.—Late fruit, exceedingly rich. Table.

PLUMS.

PLUMS are amongst the easiest trees to force, and in an orchard-house are unfailing croppers, the fruit hanging to the branches in perfect wreaths. The trees require abundance of air when in flower, and fertilization with a camel hair brush is of great advantage. Their treatment greatly resembles that of cherries; they require great care so as not to urge them on too rapidly, when the fruit is setting, and also at the time of stoning. Any sudden alternation of heat and cold is also very injurious to them. When they are swelling up, and after they have done stoning, they will be greatly improved by syringing every sunny day, and having a good supply of water to their roots. If grown in pots, very weak liquid manure once or twice a week should be supplied. When the fruit has arrived at maturity cease syringing, and give a less supply of water at the roots, and with plenty of air the fruit will ripen well, and be of a good flavour.

Insects.—The green aphis may be destroyed as recommended for the cherry.

SELECTION OF PLUMS FOR ORCHARD-HOUSES.

***COE'S GOLDEN DROP.**—Fine; good orchard-house kind; hangs long.
***DENYER'S VICTORIA.**—Fruit large; tree an immense bearer.
DRAP D'OR.—A very rich fruit.
***GREEN GAGE.**—The richest and best plum known.
***JEFFERSON.**—One of the best for orchard-houses; a great bearer.
KIRKE'S.—Very rich; great bearer; good forcer; suited for pots.
PURPLE GAGE.—Exceedingly rich; tree a great bearer.
WASHINGTON.—Very rich fruit; tree a great bearer.

STRAWBERRIES.

In orchard-houses, STRAWBERRIES may be grown either in pots or planted out close under the glass. When grown in pots they can be removed when out of fruit, and fresh ones can be brought in at different times to replace those that are removed, so as to prolong the season of fruiting by a constant succession. The chief requisites for Strawberry culture are, a rich strong loam, plenty of air, and moisture, and when the flower spikes are well up, a supply of thin liquid manure two or three times a week, and often stirring the soil to keep it from binding. The atmosphere must be kept dry whilst they are in blossom; when the fruit is set and swelling, introduce them to a stronger heat, give plenty of water, and sprinkle them over head every day in sunny weather; when the fruit is beginning to ripen, dispense with over-head watering, and water more sparingly at the roots; keep them clear of runners, and the fruit will become large and good flavoured.

When the fruit is all gathered, place the plants in a sheltered part of the garden, where they will be cool and have an opportunity of resting. About July plant them inside the orchard-house or re-pot them in new soil, and a large crop will be produced all the autumn and early winter.

To secure good plants for forcing, get the very earliest runners; plunge small pots around the old roots so that the runners will strike into them; when struck, separate from the old plants, re-pot them in larger pots, suitable for fruiting, plunge them in a bed of coal ashes, water them well during the summer, giving them occasional supplies of thin liquid manure, and before winter they will have become large and robust plants.

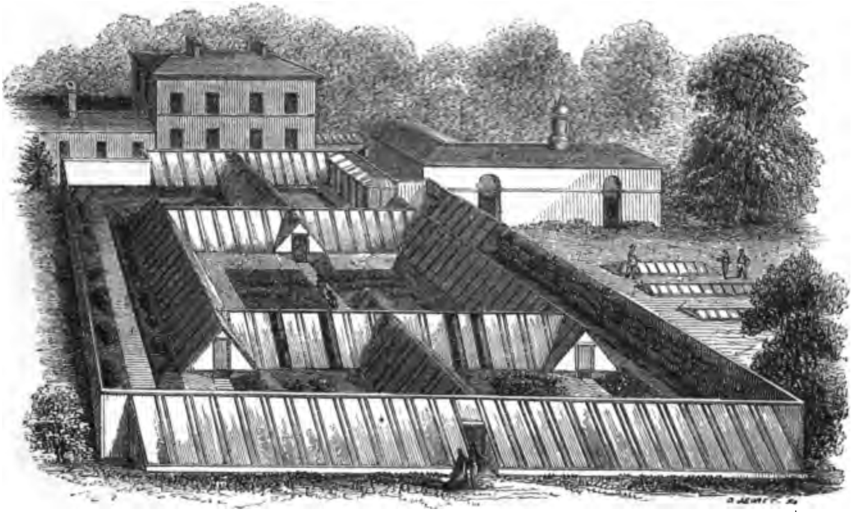
VARIOUS OTHER FRUITS SUITED FOR ORCHARD-HOUSES.

Gooseberries, Currants, double-bearing Raspberries, Guavas (Psidium Cattleyanum, pyriferum, and pomiferum), Cape Gooseberries (Physalis peruviana), Pomegranates (Punica Granatum), Jamrosade berry (Eugenia Ugni), Loquat (Eriobotrya japonica), Olive (Olea europea), Granadilla (Passiflora edulis), Lotus (Zizyphus Lotus), Jujube (Zizyphus Jujuba), Kaki (Diospyros Kaki), Lemons, Citrons, Tangerine, St. Michael's, and Maltese Blood Oranges, and even Mangoes might succeed, for in their native country they are sometimes found growing in situations where the frost is sufficiently strong to congeal the water, and yet do not appear to suffer from it.

V.—ORCHARD AND WINTER GARDENS.

Sir Joseph Paxton's patent houses may be lengthened and enlarged so as to form the boundaries of gardens; they cost less than brick walls, and the crops of fruit furnished are certain, no matter how unpropitious may be the seasons. A garden of this description on a large scale we have lately erected, and with judicious management an immense annual produce is certain.

Fig. 41.



A large connected winter garden (Fig. 41) we have erected at Summerfield House, Birmingham, the seat of R. L. Chance, Esq.; it consists of span-roofs of 14 feet sashes, so arranged with lean-tos against the walls as to form an extensive promenade of several hundred feet in length. Groves of fruit trees are planted near the side of the walks of the span-roof, grapes hang over head, and vines and various other fruit trees in pots occupy different parts; vegetables, late and early, fill up all the available space, and form an important feature during the whole of the winter and early spring. The walks are formed of neat paving tiles manufactured at the Tile Works, Himley, near Dudley, Staffordshire; they are cheap, and form a beautiful tesselated pavement: the whole garden, when in fruit, presents one of the most enchanting effects that can be imagined.

PRODUCE WHICH MAY BE EXPECTED FROM A LARGE WINTER GARDEN.

JANUARY.

In addition to the ordinary supply of Fruit and Vegetables from the open air, we may have the following produce from the Winter Garden. Of Fruit—Apples and Pears, grown either in pots or the orchard-house borders; late Grapes, still hanging on the vines; and Cucumbers, Pine Apples, and Bananas where portions of the house are extra-heated and appropriated to these purposes.

Of Vegetables—Cauliflowers and Brocoli laid in the border of the house, Spinach sown in the border, Mushrooms in the shed, Rhubarb in the lower bed of the mushroom house, Asparagus in the frame on a hot-bed, Lettuce and Endive planted in the borders, Sea Kale grown under pots with hot manure, and small Salad sown in the borders of the house.

FEBRUARY.

The same Fruit and Vegetables will be supplied as in the last month, with the addition of early Radishes and early Cabbage.

MARCH.

Fruit.—Apples, Pears, late Grapes, Strawberries, Pine Apples and Cucumbers.

Vegetables.—The same as last month, and Kidney Beans and early Potatoes grown in pots, and early Cabbage.

APRIL.

Fruit.—Old Apples and Pears, early Grapes, Strawberries, Peaches, Nectarines, Figs, Cucumbers, Pine Apples, and Green Gooseberries.

Vegetables.—Rhubarb, Asparagus, Mushrooms, Potatoes, Kidney Beans, Radishes, Small Salad, Lettuce, and early Cabbage.

MAY.

Fruit.—Early Grapes, Strawberries, Peaches, Nectarines, Apricots, Plums, Cherries, Figs, Cucumbers, Melons, Pines, Gooseberries, Currants, and Raspberries.

Vegetables will now begin to come in plentifully out of doors, so the ground will for the most part be cleared inside. However Mushrooms, Kidney Beans, and new Potatoes will still be supplied from glass, and Peas and Beans.

JUNE.

Fruit.—Grapes, Peaches, Nectarines, Apricots, Plums, Cherries, Figs, Cucumbers, Pine Apples, Gooseberries, Currants, Raspberries, Apples, Pears, Melons, and most other kinds of Fruit.

Vegetables.—Mushrooms are now about the only crop requiring in-door culture.

JULY.

Fruit.—Apples, Pears, Apricots, Peaches, Nectarines, late Cherries, Figs, Melons, Cucumbers, and Grapes are the principal Fruit inside. The crops in the open air will now be generally fit for use.

Vegetables.—Except Mushrooms, all kinds of Vegetables are now abundant outside.

AUGUST.

Fruit.—Every kind of Fruit of the season is now in perfection.

Vegetables.—All kinds are now in perfection in the open air.

SEPTEMBER.

Fruit and **Vegetables** of all kinds can now be supplied for table.

OCTOBER.

Fruit.—In addition to the usual kinds of Fruit ripe at this season of the year, Strawberries are supplied in the winter garden from roots forced for early crops in Spring, Currants and Gooseberries protected by mats, and Cape Gooseberries.

NOVEMBER.

Fruit.—Apples, Pears, Figs, Melons, Cucumbers, late Strawberries, Raspberries from double-bearing canes, Grapes, Pines, Bananas, Cape Gooseberries, Currants and Gooseberries which have been kept back by matting, and Eugenia Ugni.

Vegetables.—Mushrooms, Cauliflowers brought into the winter garden borders, Brocoli, late crop of Kidney Beans, late Peas and Beans, Lettuce, Endive, small Salad, and Radishes.

DECEMBER.

Fruit.—Apples, Pears, Cucumbers, Strawberries, Grapes, Pines, and Bananas.

Vegetables.—Mushrooms, Cauliflowers, Brocoli, Lettuce, Endive, and small Salad.

MEMORANDA OF WORK TO DO IN A WINTER GARDEN.

JANUARY.

VEGETABLES.—*Sow* second crop of Peas and Beans—Bishop's and Marshall's prolific. Lettuce and Endive—hardy white and Rouen curled.
A succession of Spinach—prickly.
Fulmer's forcing Kidney Beans.
A succession of Radishes—new winter China.
Plant Potatoes—early Handsworth and ash-leaved kidney.
Force roots of Rhubarb—Scarlet Defiance is perhaps the best.
Asparagus roots in frames.
Sea Kale under pots and manure.
FRUIT.—*Bring in* first crop of Strawberries in pots.
Peach and Nectarine Trees in pots.
Plum Trees for first crop.
Vines in pots for successive crops.

FEBRUARY.

VEGETABLES.—*Sow* Royal Dwarf and Groom's superb blue Peas.
Early Mazagan and early Lisbon Beans.
Mohawk and Newington Wonder Kidney Beans.
A succession of Spinach—prickly.
A succession of Radishes—olive-shaped scarlet.
Early Dutch and earliest red horn Carrots.
Carter's Giant white Coss and Victoria Lettuces.
New mossy green and white curled Endive.
FRUIT.—*Bring in* succession Strawberries in pots.
Peaches and Nectarine Trees in pots.
Plum Trees in pots.
Fig Trees in pots.
Vines in pots for succession.
Apricots in pots, and place in a very light aud cool place.
Apples and Pears, and place in a cool part of house.
Cherries, Currants, and Gooseberries.
Plant Potatoes—Lapstone kidney, Delmahoy, and Pheasant's Eye.
Force Rhubarb, Asparagus, and Sea Kale, as before.

MARCH.

General cropping out of doors now takes place, but it is necessary to sow indoors.

VEGETABLES.—The Negro long-podded and Newington Wonder Kidney Beans, and a succession of Radishes, to come in before those in the open air.

FRUIT.—*Bring in* all kinds now intended to be grown in pots.

APRIL, MAY, JUNE.

In these months no crops will require to be sown or planted under glass; every available space may be occupied by Melons and Fruits of different kinds.

JULY.

Sow a small crop of Peas to succeed those sown out of doors—Royal Dwarf.
A small crop of Beans—Marshall's Dwarf Prolific.
A few rows of Kidney Beans—Mohawk.
Plant Cauliflower plants which were sown out of doors at the end of May. Select a cold part of the house—Carter's Dwarf, Mammoth, and Walcheren are the best for this time: these will be in cutting down to Christmas.

AUGUST.

Sow the last crop of Peas in the first week of the month—Beck's gem and Groom's superb dwarf blue: this last crop is seldom very prolific.
The last crop of Beans—Early Dwarf Fan and Lisbon.
The last crop of Kidney Beans—Fulmer's forcing and Newington Wonder: both Beans and Kidney Beans must be sown in the first week.
Carrots—the earliest red horn for drawing early in Spring.
Radishes to succeed Turnip Radishes growing in the open air—New Winter China.

SEPTEMBER.

Sow the winter crop of Spinach in addition to that out of doors, which may, if the weather prove severe, be killed—the common prickly seeded and the Flanders are the best.
Radishes at the end to succeed those sown last month—Olive-shaped Scarlet is of quick growth, which is very important now.
Small Salad, about the end, to succeed that sown out of doors.
Plant Lettuces to succeed those out of doors—The Hardy White and Carter's Giant White Coss are better than the cabbage Lettuce for winter, as the latter is apt to rot.
Young Cabbage plants to cut in the winter, and until the approach of spring.
Endive for salading—New Mossy Green and Rouen Curled are both good, and a few of the old Batavian is useful if well blanched.

OCTOBER.

Plant Cabbage plants sown out of doors in August for cutting in early spring.
Lettuce sown in August for coming into use after Christmas.
Plant out old roots of Scarlet Runner Kidney Beans before they are injured by frost; they will bear a very large crop very early in the spring.
Endive sown in August to come in after Christmas.
Sow Small Salad for succession.
Bring in Brocoli for winter and spring use, in addition to that planted in the ordinary way outside. Should the winter prove severe, and the whole in the open air be destroyed, there will be a good supply retained under cover—Lee's White Sprouting, Dalmeney, Walcheren, New Giant White, Victoria, and Conning's Perfection, will give a supply in-doors until Cauliflowers are in use in the open air again.

NOVEMBER.

Plant Lettuce and Endive as before from seed beds for succession.

Sow Small Salad as before.

Prepare roots of Sea Kale for forcing by clearing away all the dead leaves of the plants from the crown, and laying a little clean sharp sand about them, after which place on the pots.

Rhubarb roots for blanching under pots, clear away dead leaves, and lay over the crowns a thick layer of manure, to preserve them from the winter's frost.

DECEMBER.

Sow Peas for an early spring crop—Beck's Gem.

Beans for an early spring crop—Early Dwarf Fan.

Small Salad for succession.

Radishes, for drawing shortly after Christmas.

Plant Lettuce and Endive for succession.

Force Asparagus roots in hotbeds for produce about Christmas.

Rhubarb roots in Mushroom shed, and cover roots in open air with pots and long litter.

Sea Kale, by warm manure being laid about the pots.

Prepare to bring in fruit trees in pots next month, top dress, and do not allow the frost to injure the buds or roots.

Vines in pots for the first crop.

LIST OF VEGETABLES SUITED FOR WINTER GARDEN CULTURE.

BEANS.—Early Dwarf Fan. A small branching kind; good bearer.
  Marshall's Dwarf Prolific. Pods grow in clusters.
  Early Mazagan. Small, but early, and a good bearer.
  Early Lisbon. Larger size than Mazagan, and early.

KIDNEY BEANS.—Fulmer's Forcing. An early prolific kind.
  Mohawk. Dwarf, early, and prolific.
  Newington Wonder. A great bearer, and early.
  Negro Long-podded. A great bearer, and early.

KIDNEY BEANS (Scarlet Runners).—The old well-known kind. It is a perennial, and the old roots will bear for several years if preserved from the frost.
  Giant White. A great bearer, and the pods long.

BROCOLI.—Lee's White Sprouting. A fine branching kind, in use all the winter.
  Conning's Perfection. A new and valuable white kind.
  Dalmeney. A large white head, equal to a cauliflower.
  Walcheren. Quite equal to a cauliflower; cuts till Christmas.
  New Giant White. A large and fine head; comes in late.
  Victoria. A good white close head; comes into use in March and April.
  White Cape. A delicate and very useful kind.

Cauliflower.—Walcheren. The same as the Walcheren Brocoli. By successional sowings of this kind every three weeks from March to the end of July, a supply of fine heads will be produced until Christmas.

Carter's Dwarf Mammoth. A large and compact kind; first-rate for early winter use.

Frogmore Forcing. A good one for early spring.

Carrots.—Early Dutch. A short horn; very good for early crops.

Earliest Red Horn. One of the best for early use.

Endive.—New Mossy Green. A fine curled and crisp one.

Rouen Curled. Blanches well in winter if kept dry.

White Curled. Delicately crisp; liable to be injured by damp in winter.

Lettuce.—Carter's Giant White Coss is a fine blanching kind.

Victoria. A fine Cabbage Lettuce, good for early spring.

Hardy White. A first-rate winter kind; grows fine.

Paris Green. A crisp delicate-flavoured kind.

Peas.—Beck's Gem. A very early dwarf kind; good bearer.

Bishop's Long-podded. A good second early kind; prolific.

Royal Dwarf. A most abundant bearer, and early.

Groom's Superb Dwarf Blue. An abundant bearer.

Paul's Tom Thumb. An abundant bearer, and early. All these grow from a foot to eighteen inches in height.

Radishes.—Olive-shaped Scarlet. A fine Radish, eats crisp and without stringiness.

New Winter China. A solid and very good kind. Sown once a month, a constant succession may be obtained all the winter.

Rhubarb.—Scarlet Defiance is a rich colour and of delicate flavour.

Potatoes.—Early Handsworth. A round tuber, and very early.

Ash-leaved Kidney. The most delicate flavoured early potato known.

Lapstone Kidney is a second early. A most valuable kind, and continues in eating for a long time.

Dalmahoy. A round tuber; second early; very good.

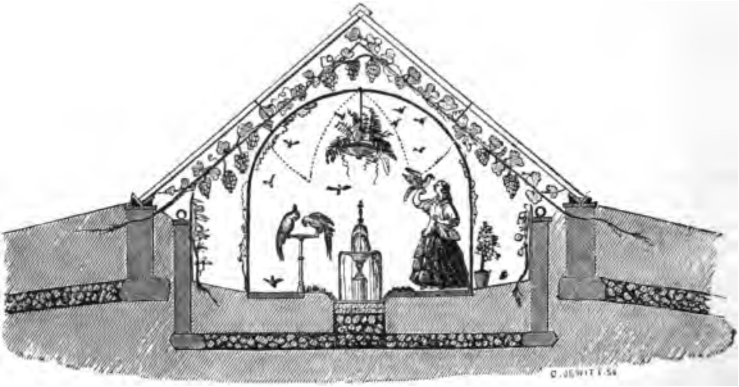
Pheasant's Eye. Round. A great bearer, and good.

⁂ None of the above potatoes appear to suffer from disease like the late kinds.

VI.—ORCHARD-HOUSE AVIARIES.

In addition to the growth of fruit and flowers these houses may be made a great source of gratification and amusement by being converted into what may be called orchard-house aviaries for small birds; a different arrangement of the interior only being requisite; the general elevation or shell of the structure being the same as in ordinary vineries. The accompanying section (Fig. 42) will give some idea of what is meant. When an aviary is intended to be combined with a fruit, or flower house, we would erect a close wire trellis on each side the whole length of the house, about 4 feet from the side piers, and arched overhead. Outside of this wire inclosure or cage we would build a 9-inch wall, at about a foot from the piers to support the soil. The piers on which the house stands should be 3 feet high; this will allow a good elevation for the vine border. On the top of the interior walls the hot-water pipes would rest; a single pipe round the house will be sufficient. Against the interior walls we would train peach and nectarine trees to a trellis. The centre walk

Fig. 42.



from the door should descend about a foot or so to the middle of the house, where we would have a shallow glass basin and a small fountain, at which the birds can drink and wash themselves. The vines should be planted outside, one under each sash, and trained inside with wires in the usual way. The interior of the cage should be planted with ornamental shrubs, so as to form thickets in which the birds would build. Flowering creepers should be trained to the wire trellis at intervals, all over the house; these would give, when in bloom, a very gay appearance. Openings in the wire trellis must be made under each ventilator to allow of dressing the vines and gathering the fruit.

It is scarcely necessary to give a list of birds to be kept in such a structure, as all lovers of them have their own especial favourites. Still, where a reference to a work on cage-birds is not at hand, a selection of a few pretty hard-billed species may be of service.

SELECTION OF SMALL HARD-BILLED BIRDS.

Amandava, or Avadavat—an exceedingly pretty bird.
Banded Finch.
Blue Finch—a very beautiful bird.
Brown-cheeked Finch.
Canary.
Cape Finch.
Chaffinch.
Citril Finch.
Common Quail.
Goldfinch.
Gowry Bird, or Nutmeg Bird.
Indigo Bird—very beautiful plumage.
Java Sparrow, or Rice Bird.
Lesser Redpole.
Linnet.
Malacca Finch.
Mountain Bunting.
Purple Finch.
Redbill—a very agreeable little bird.
Siskin.
The Bullfinch is a most interesting bird in an aviary, but it will disbud the trees in the winter, and thus prevent their fruitfulness when planted inside the cage.
Virginian Nightingale, or Cardinal Grosbeak.
Waxbill—a small and beautiful little bird.

Amongst the fruit-trees which might be planted inside the wire inclosure may be mentioned standard apples, pears, plums, raspberries, and many other fruits, and in different portions of the aviary, patches of chickweed, groundsel and other green food suitable for the health of the birds should be grown; these weeds would be entirely hidden by the judicious planting of ornamental shrubs. Camellias, Roses, Eugenia Ugni, Acacias, Azaleas, Fuchsias, Myrtles, Pomegranates, tender Rhododendrons, Clethra arborea, Eriobotrya japonica, and many other ornamental shrubby plants might be grown in such a house.

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